

Appendix 4

Effects of the Short Spacings of the Required Separations for Digital Television on the Total Coverage

1.0 Calculation of the required separation distances

The required distances were calculated using the protection ratios and the class parameters as described in the document AHG_DTV003_ Digital Television: Service Considerations and Allotment Principles. Knowing the field strength value of the wanted signal at the protected contour and the required protection ratio, the maximum interfering field at that location can be easily determined. The maximum interfering field value is given by the value of the wanted signal at the protected contour minus the protection ratio plus the antenna discrimination minus the location variability factor to convert from F(50,10) to F(10,10) values when applicable. The antenna discrimination for the band is defined in the ITU-R recommendation BT.419-3.

The F(50,10) curves were used to calculate the distance from the interfering station to the interfering contour. For the cases where the service was calculated with the F(90,90) values, a location variability factor was subtracted from the maximum interfering field strength to compensate for the change in the percentage of locations, in order to obtain an equivalent F(10,10) value. The factor used was obtained from the figures 5 and 12 of the ITU-R recommendation P.370-7. Once the distance to the interfering contour was calculated, it was added to the Grade B distance of the protected contour to obtain the total required distance separation between the protected and interfering stations.

When the distance of the interfering station to the protected contour was less than 1.5 km, no value could be returned from the F(50,10) curve. In that case, 10 dB was added to the interfering station power and a new distance was computed. If that new distance was greater or equal to 1.5 km, it was assumed that a distance of 1 km was required between the interfering station and the protected contour. But if the new distance was still less than 1.5 km, then an additional 10 dB was added to the interfering station power (for a total increase of 20 dB) and another new distance was computed. If this final distance was greater or equal to 1.5 km, it was assumed that the interfering station had to be located on the protected contour in order to avoid interference. But if the final distance was still lower than 1.5 km, then it was assumed that the interfering station would never cause interference to the protected station and there was no required distance separation in that case. Of course, these cases happened only when calculating required distances for adjacent channels. The symmetrical required separation distance was computed the same way and the larger distance was retained as the final required separation.

2.0 Calculation of the service contours

Once the required distance was computed, it was short spaced according to the percentage chosen. If the resulting distance was still greater than the radius of the Grade B contour of the protected station, the service contours were computed by finding, for different azimuths around the protected station, the point where the protection ratio was reached. These points were found at every 5 degrees around the protected station and gave the shape of the final service contour. The total area of the final service contour was calculated using the MapInfo software.

If the resulting short spaced distance was less than the Grade B distance of the protected station, i.e. the short spacing moved the interfering station inside the Grade B contour of the wanted station, the service contours were computed differently. First it was found, for different azimuths around the interfering station, the point at which the protected ratio was sufficient, within the Grade B contour of the protected station. The points found gave the shape of the hole that the interfering station caused in the protected contour. To obtain the area of the total service contour, the area of the hole was subtracted from the protected contour area.

The calculation of the protection ratios used basically the same factors as the ones involved in the calculation of the required separation distances. The only difference was in the use of the antenna discrimination. At each potential reception point, the angle between the signal coming from the desired station and the signal coming from the interfering station was computed and it was possible to obtain a more accurate value of the antenna discrimination by interpolating the value from the figure 1 of the ITU-R recommendation BT.419-3.

3.0 The results

The results for low VHF band, high VHF band and UHF band for co-channel short spacings are given in the Tables 1 to 3 respectively for F(50,90) values and in the Tables 4 to 6 for F(90,90) values. The equivalent results for the first adjacent channel short spacings are presented in the Tables 7 to 12.

As expected, the short spacing of the adjacent channel required separation distances has a much smaller effect than the short spacing of the co-channel separation distances. Also, one can note that, in the case of the co-channel short spacings, the percentage of coverage loss is much higher in the cases of small size ('LP' and 'A') protected stations. But the effect of the short spacing of those small size stations on large ones ('C', 'VU' and 'VL') is almost negligible. Two examples showing the shapes of the reduced service contours are shown in the Figures 1 and 2. In the Figure 1, the service contour of a class 'A' station is shown when reduced by 30% short-spacing on co-channel in the UHF band. The 6 reduced contours correspond to stations of the different classes: 'A', 'B', 'C', 'LP', 'VU' and 'VL'. In the Figure 2, a similar graphic is given for a

class 'VU' station in the upper VHF band. In this case there is no reduction in the coverage due to a class 'LP' station.

In the case of the first adjacent channel required distances, a short spacing of up to 30% never results in a decrease of more than 5% of the service coverage. There is only one exception to that rule, the LP station in the UHF band, and it is shown in the Figure 3. In that case, the required separation distance allows the LP station to be within the Grade B contour of the bigger class stations and the short spacing of the required distance has a noticeable effect on the 'LP' service contour.

An unexpected result of this short spacing study is the reduction of coverage when there is no short spacing at all. This reduction appears on small power stations in the co-channel study and is due to the fact that, when the protected and the interfering stations are aligned, there is no antenna discrimination in the far side of the coverage and the Grade B diameter of the small station is insufficient to provide a reduction in the maximum interfering field strength, corresponding to the lack of antenna discrimination. This is worse in the UHF band where the antenna discrimination is the greatest, i.e. 16 dB; so on the opposite side of the protected contour, the maximum permissible field strength is 16 dB lower than the maximum permissible field strength on the side of the protected contour which is closer to the interference station. The Figure 4 shows an example of this coverage reduction for a LP class in the UHF band with F(90,90) values.

4.0 Recalculating the separation distances

The coverage reduction observed in some small class stations with no short spacing led to the recalculation of some of the required distances. To do so, the first step is to determine on the protected contour, the closest point to the interfering station where there is no antenna discrimination. Then knowing the maximum permissible interference field strength without antenna discrimination, it is easy to obtain the required distance between that point and the interfering station. And using some simple geometry concepts, the required distance between the two stations can be computed. The resulting changes in the co-channel required separation distances are shown in the Tables 13a, b, c, d, e and f for the Digital Television (DTV->DTV). The separation values between NTSC and Digital Television were also reviewed and the required changes are shown in the Tables 14a, b and c (DTV->NTSC) and the Tables 15a, b and c (NTSC->DTV).

Table 1. Percentage of coverage loss due to co-channel short spacing in the lower VHF band F(50,90), for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-3.8	-9.8	-22.2
A	B	1961	-6.6	-25.4	-48.0
A	C	1961	-14.4	-40.2	-60.8
A	LP	1961	0.0	0.0	-0.9
A	VU	1961	-19.1	-46.8	-65.9
A	VL	1961	-22.1	-50.6	-69.5
B	A	6354	0.0	-0.6	-4.3
B	B	6354	-3.4	-9.4	-18.0
B	C	6354	-4.7	-13.3	-35.3
B	LP	6354	0.0	0.0	0.0
B	VU	6354	-5.8	-17.9	-45.8
B	VL	6354	-6.4	-22.3	-51.8
C	A	15374	0.0	0.0	-0.3
C	B	15374	0.0	-1.2	-5.3
C	C	15374	-2.8	-8.1	-15.2
C	LP	15374	0.0	0.0	0.0
C	VU	15374	-3.5	-9.7	-18.4
C	VL	15374	-3.8	-10.9	-22.1
LP	A	452	-11.1	-28.8	-46.9
LP	B	452	-20.8	-42.9	-61.1
LP	C	452	-27.9	-51.1	-68.1
LP	LP	452	-2.9	-10.6	-24.6
LP	VU	452	-32.5	-55.3	-71.2
LP	VL	452	-34.5	-58.8	-74.1
VU	A	21097	0.0	0.0	0.0
VU	B	21097	0.0	0.0	-2.1
VU	C	21097	-0.2	-3.4	-8.9
VU	LP	21097	0.0	0.0	0.0
VU	VU	21097	-2.9	-8.2	-15.2
VU	VL	21097	-3.2	-9.2	-17.1
VL	A	24853	0.0	0.0	0.0
VL	B	24853	0.0	0.0	-0.8
VL	C	24853	0.0	-1.5	-6.0
VL	LP	24853	0.0	0.0	0.0
VL	VU	24853	-1.0	-5.1	-11.2
VL	VL	24853	-2.8	-8.3	-15.4

Table 2. Percentage of coverage loss due to co-channel short spacing in the upper VHF band F(50,90), for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-3.1	-7.6	-21.5
A	B	1961	-7.3	-23.2	-42.6
A	C	1961	-19.5	-38.6	-61.1
A	LP	1961	0.0	-0.4	-3.1
A	VU	1961	-23.3	-43.6	-63.5
A	VL	1961	-25.3	-47.1	-65.6
B	A	6354	0.0	-1.5	-4.8
B	B	6354	-3.1	-8.2	-14.6
B	C	6354	-4.2	-14.6	-33.3
B	LP	6354	0.0	0.0	-0.6
B	VU	6354	-4.7	-21.7	-42.1
B	VL	6354	-6.5	-25.0	-47.2
C	A	15374	0.0	0.0	-1.3
C	B	15374	0.0	-1.8	-5.5
C	C	15374	-2.4	-6.9	-12.9
C	LP	15374	0.0	0.0	0.0
C	VU	15374	-2.5	-7.3	-14.1
C	VL	15374	-2.8	-8.0	-16.7
LP	A	452	-17.0	-28.8	-43.1
LP	B	452	-22.8	-43.1	-61.9
LP	C	452	-29.6	-53.5	-71.5
LP	LP	452	-6.4	-14.4	-24.1
LP	VU	452	-31.9	-53.8	-71.0
LP	VL	452	-34.1	-55.5	-71.2
VU	A	21097	0.0	0.0	-0.1
VU	B	21097	0.0	-0.1	-2.5
VU	C	21097	-0.2	-3.0	-7.6
VU	LP	21097	0.0	0.0	0.0
VU	VU	21097	-2.1	-6.2	-11.9
VU	VL	21097	-2.4	-6.7	-12.8
VL	A	24853	0.0	0.0	0.0
VL	B	24853	0.0	0.0	-1.0
VL	C	24853	0.0	-1.1	-4.9
VL	LP	24853	0.0	0.0	0.0
VL	VU	24853	-0.5	-3.5	-8.4
VL	VL	24853	-2.2	-6.2	-11.7

Table 3. Percentage of coverage loss due to co-channel short spacing in the UHF band F(50,90), for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-0.0	-0.0	-0.1
A	B	1961	-0.1	-0.2	-0.4
A	C	1961	-0.2	-0.4	-0.5
A	LP	1961	0	-0.0	-0.0
A	VU	1961	-0.2	-0.5	-0.6
A	VL	1961	-0.3	-0.5	-0.7
B	A	6354	0	-0.0	-0.0
B	B	6354	-0.0	-0.0	-0.1
B	C	6354	-0.0	-0.1	-0.3
B	LP	6354	0	0	-0.0
B	VU	6354	-0.1	-0.2	-0.4
B	VL	6354	-0.1	-0.2	-0.4
C	A	15374	0	0	0
C	B	15374	0	0	-0.0
C	C	15374	-0.0	-0.0	-0.1
C	LP	15374	0	0	0
C	VU	15374	-0.0	-0.0	-0.2
C	VL	15374	-0.0	-0.1	-0.2
LP	A	452	-0.1	-0.2	-0.4
LP	B	452	-0.2	-0.4	-0.6
LP	C	452	-0.3	-0.5	-0.6
LP	LP	452	-0.0	-0.1	-0.2
LP	VU	452	-0.3	-0.5	-0.7
LP	VL	452	-0.3	-0.6	-0.7
VU	A	21097	0	0	0
VU	B	21097	0	0	0
VU	C	21097	0	-0.0	-0.0
VU	LP	21097	0	0	0
VU	VU	21097	-0.0	-0.0	-0.1
VU	VL	21097	-0.0	-0.0	-0.1
VL	A	24853	0	0	0
VL	B	24853	0	0	0
VL	C	24853	0	0	-0.0
VL	LP	24853	0	0	0
VL	VU	24853	-0.0	-0.0	-0.1
VL	VL	24853	-0.0	-0.0	-0.1

Table 4. Percentage of coverage loss due to co-channel short spacing in the lower VHF band F(90,90), for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-6.8	-26.3	-47.2
A	B	1961	-14.3	-40.2	-59.5
A	C	1961	-22.7	-51.9	-71.0
A	LP	1961	0.0	-0.9	-7.8
A	VU	1961	-27.4	-57.5	-75.6
A	VL	1961	-30.2	-60.7	-78.3
B	A	6354	0.0	0.0	-4.2
B	B	6354	-4.8	-13.7	-37.1
B	C	6354	-6.9	-25.3	-54.9
B	LP	6354	0.0	0.0	0.0
B	VU	6354	-8.2	-34.2	-62.6
B	VL	6354	-9.2	-39.4	-66.8
C	A	15374	0.0	0.0	-0.1
C	B	15374	0.0	-2.3	-8.1
C	C	15374	-4.1	-11.6	-24.5
C	LP	15374	0.0	0.0	0.0
C	VU	15374	-4.9	-13.8	-31.9
C	VL	15374	-5.4	-15.3	-38.2
LP	A	452	-21.5	-41.8	-59.1
LP	B	452	-28.8	-50.2	-66.2
LP	C	452	-36.1	-60.4	-75.9
LP	LP	452	-16.4	-29.4	-41.8
LP	VU	452	-40.0	-64.6	-79.6
LP	VL	452	-42.5	-67.3	-81.6
VU	A	21097	0.0	0.0	0.0
VU	B	21097	0.0	-0.1	-3.8
VU	C	21097	-0.5	-5.5	-13.3
VU	LP	21097	0.0	0.0	0.0
VU	VU	21097	-4.1	-11.6	-23.4
VU	VL	21097	-4.5	-12.8	-27.2
VL	A	24853	0.0	0.0	0.0
VL	B	24853	0.0	0.0	-2.0
VL	C	24853	0.0	-2.9	-9.4
VL	LP	24853	0.0	0.0	0.0
VL	VU	24853	-1.6	-7.5	-16.3
VL	VL	24853	-4.0	-11.5	-23.1

Table 5. Percentage of coverage loss due to co-channel short spacing in the upper VHF band F(90,90), for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-9.8	-24.1	-42.0
A	B	1961	-19.7	-36.6	-56.8
A	C	1961	-25.2	-47.8	-66.2
A	LP	1961	0.0	-0.1	-6.6
A	VU	1961	-29.0	-54.6	-72.1
A	VL	1961	-31.0	-57.9	-75.4
B	A	6354	0.0	-1.6	-7.0
B	B	6354	-3.7	-15.3	-32.8
B	C	6354	-7.1	-26.2	-49.0
B	LP	6354	0.0	0.0	0.0
B	VU	6354	-10.9	-33.3	-57.8
B	VL	6354	-13.6	-37.2	-62.3
C	A	15374	0.0	0.0	-0.1
C	B	15374	0.0	-0.4	-4.1
C	C	15374	-3.0	-8.3	-18.3
C	LP	15374	0.0	0.0	0.0
C	VU	15374	-3.7	-10.4	-26.7
C	VL	15374	-4.1	-12.0	-32.3
LP	A	452	-23.7	-42.9	-60.8
LP	B	452	-29.0	-50.2	-67.5
LP	C	452	-35.6	-56.9	-72.1
LP	LP	452	-19.0	-29.4	-41.8
LP	VU	452	-40.0	-62.6	-76.3
LP	VL	452	-42.5	-65.3	-79.0
VU	A	21097	0.0	0.0	0.0
VU	B	21097	0.0	0.0	-1.1
VU	C	21097	-0.1	-3.4	-8.9
VU	LP	21097	0.0	0.0	0.0
VU	VU	21097	-3.1	-8.7	-16.8
VU	VL	21097	-3.4	-9.8	-21.5
VL	A	24853	0.0	0.0	0.0
VL	B	24853	0.0	0.0	-0.2
VL	C	24853	0.0	-1.4	-5.9
VL	LP	24853	0.0	0.0	0.0
VL	VU	24853	-1.0	-5.4	-11.9
VL	VL	24853	-3.1	-8.8	-17.0

Table 6. Percentage of coverage loss due to co-channel short spacing in the UHF band F(90,90), for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-17.2	-27.5	-40.9
A	B	1961	-24.2	-39.2	-55.5
A	C	1961	-31.3	-54.8	-71.8
A	LP	1961	-4.5	-9.0	-16.7
A	VU	1961	-35.4	-61.1	-77.5
A	VL	1961	-37.4	-63.3	-79.4
B	A	6354	0.0	0.0	0.0
B	B	6354	-7.6	-18.0	-31.2
B	C	6354	-13.4	-30.1	-50.4
B	LP	6354	0.0	0.0	0.0
B	VU	6354	-16.6	-37.2	-58.7
B	VL	6354	-18.1	-39.9	-61.5
C	A	15374	0.0	0.0	0.0
C	B	15374	0.0	0.0	-1.1
C	C	15374	-3.2	-12.6	-27.2
C	LP	15374	0.0	0.0	0.0
C	VU	15374	-5.3	-18.0	-35.7
C	VL	15374	-6.5	-20.1	-38.9
LP	A	452	-25.0	-40.0	-58.0
LP	B	452	-31.2	-48.9	-62.4
LP	C	452	-40.9	-62.2	-76.3
LP	LP	452	-21.0	-30.5	-42.7
LP	VU	452	-44.9	-67.5	-80.8
LP	VL	452	-46.9	-69.2	-82.3
VU	A	21097	0.0	0.0	0.0
VU	B	21097	0.0	0.0	0.0
VU	C	21097	0.0	-2.5	-8.6
VU	LP	21097	0.0	0.0	0.0
VU	VU	21097	-3.6	-13.7	-29.5
VU	VL	21097	-3.9	-15.6	-32.7
VL	A	24853	0.0	0.0	0.0
VL	B	24853	0.0	0.0	0.0
VL	C	24853	0.0	-1.4	-6.8
VL	LP	24853	0.0	0.0	0.0
VL	VU	24853	-2.1	-8.5	-23.2
VL	VL	24853	-4.0	-14.1	-30.6

Table 7. Percentage of coverage loss due to adjacent channel (-1) short spacing in the lower VHF band F(50,90), for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-0.3	-0.3	-0.3
A	B	1961	0.0	0.0	0.0
A	C	1961	0.0	0.0	0.0
A	LP	1961	-0.2	-0.2	-0.2
A	VU	1961	0.0	0.0	0.0
A	VL	1961	0.0	0.0	0.0
B	A	6354	-0.1	-0.1	0.0
B	B	6354	-0.4	-0.6	-0.4
B	C	6354	0.0	0.0	-0.1
B	LP	6354	0.0	0.0	0.0
B	VU	6354	0.0	0.0	0.0
B	VL	6354	0.0	0.0	0.0
C	A	15374	0.0	0.0	0.0
C	B	15374	-0.2	-0.2	-0.1
C	C	15374	-0.5	-1.0	-0.8
C	LP	15374	0.0	0.0	0.0
C	VU	15374	0.0	-0.8	-1.7
C	VL	15374	0.0	-0.5	-1.6
LP	A	452	0.0	0.0	0.0
LP	B	452	0.0	0.0	0.0
LP	C	452	0.0	0.0	0.0
LP	LP	452	-0.7	-0.7	-0.4
LP	VU	452	0.0	0.0	0.0
LP	VL	452	0.0	0.0	0.0
VU	A	21097	0.0	0.0	0.0
VU	B	21097	-0.2	-0.1	-0.1
VU	C	21097	-0.4	-0.8	-0.5
VU	LP	21097	0.0	0.0	0.0
VU	VU	21097	-0.6	-1.2	-1.4
VU	VL	21097	-0.4	-1.2	-2.2
VL	A	24853	0.0	0.0	0.0
VL	B	24853	-0.1	-0.1	0.0
VL	C	24853	-0.4	-0.6	-0.3
VL	LP	24853	0.0	0.0	0.0
VL	VU	24853	-0.5	-1.1	-1.0
VL	VL	24853	-0.6	-1.3	-2.0

Table 8. Percentage of coverage loss due to adjacent channel (-1) short spacing in the upper VHF band F(50,90), for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-0.2	-0.2	-0.2
A	B	1961	0.0	0.0	0.0
A	C	1961	0.0	0.0	0.0
A	LP	1961	-0.1	-0.1	-0.1
A	VU	1961	0.0	0.0	0.0
A	VL	1961	0.0	0.0	0.0
B	A	6354	-0.1	-0.1	0.0
B	B	6354	-0.2	-0.2	-0.1
B	C	6354	0.0	0.0	0.0
B	LP	6354	0.0	0.0	0.0
B	VU	6354	0.0	0.0	0.0
B	VL	6354	0.0	0.0	0.0
C	A	15374	0.0	0.0	0.0
C	B	15374	-0.1	-0.1	0.0
C	C	15374	-0.3	-0.6	-0.2
C	LP	15374	0.0	0.0	0.0
C	VU	15374	0.0	-0.5	-1.0
C	VL	15374	0.0	-0.4	-1.1
LP	A	452	0.0	0.0	0.0
LP	B	452	0.0	0.0	0.0
LP	C	452	0.0	0.0	0.0
LP	LP	452	-0.4	-0.2	-0.2
LP	VU	452	0.0	0.0	0.0
LP	VL	452	0.0	0.0	0.0
VU	A	21097	0.0	0.0	0.0
VU	B	21097	-0.1	0.0	0.0
VU	C	21097	-0.2	-0.3	-0.1
VU	LP	21097	0.0	0.0	0.0
VU	VU	21097	-0.4	-0.8	-0.7
VU	VL	21097	-0.3	-0.8	-1.4
VL	A	24853	0.0	0.0	0.0
VL	B	24853	0.0	0.0	0.0
VL	C	24853	-0.2	-0.2	-0.1
VL	LP	24853	0.0	0.0	0.0
VL	VU	24853	-0.3	-0.7	-0.5
VL	VL	24853	-0.4	-0.9	-1.4

Table 9. Percentage of coverage loss due to adjacent channel (-1) short spacing in the UHF band F(50,90), for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-0.3	-0.2	-0.2
A	B	1961	0.0	0.0	0.0
A	C	1961	0.0	0.0	0.0
A	LP	1961	0.0	0.0	0.0
A	VU	1961	0.0	0.0	0.0
A	VL	1961	0.0	0.0	0.0
B	A	6354	-0.1	-0.1	0.0
B	B	6354	-0.2	-0.4	-0.2
B	C	6354	0.0	0.0	-0.1
B	LP	6354	0.0	0.0	0.0
B	VU	6354	0.0	0.0	0.0
B	VL	6354	0.0	0.0	0.0
C	A	15374	0.0	0.0	0.0
C	B	15374	-0.2	-0.1	-0.1
C	C	15374	-0.4	-0.9	-1.4
C	LP	15374	0.0	0.0	0.0
C	VU	15374	-0.1	-0.8	-1.6
C	VL	15374	0.0	-0.7	-1.7
LP	A	452	-0.9	-1.1	-0.9
LP	B	452	0.0	-1.5	-2.4
LP	C	452	-1.3	-3.5	-6.2
LP	LP	452	0.0	0.0	0.0
LP	VU	452	-2.0	-6.4	-15.7
LP	VL	452	-3.1	-12.4	-22.3
VU	A	21097	0.0	0.0	0.0
VU	B	21097	-0.1	-0.1	0.0
VU	C	21097	-0.4	-0.8	-0.9
VU	LP	21097	0.0	0.0	0.0
VU	VU	21097	-0.6	-1.2	-1.9
VU	VL	21097	-0.4	-1.2	-2.0
VL	A	24853	0.0	0.0	0.0
VL	B	24853	-0.1	-0.1	0.0
VL	C	24853	-0.3	-0.7	-0.7
VL	LP	24853	0.0	0.0	0.0
VL	VU	24853	-0.6	-1.1	-1.8
VL	VL	24853	-0.6	-1.3	-2.1

Table 10. Percentage of coverage loss due to adjacent channel (-1) short spacing in the lower VHF band F(90,90), for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-0.7	-1.4	-1.8
A	B	1961	0.0	0.0	0.0
A	C	1961	0.0	0.0	0.0
A	LP	1961	-0.3	-0.3	-0.3
A	VU	1961	0.0	0.0	0.0
A	VL	1961	0.0	0.0	0.0
B	A	6354	-0.4	-0.6	-0.4
B	B	6354	-0.7	-1.6	-2.5
B	C	6354	0.0	0.0	-1.3
B	LP	6354	-0.1	-0.1	-0.1
B	VU	6354	0.0	0.0	-1.1
B	VL	6354	0.0	0.0	-1.4
C	A	15374	-0.2	-0.2	-0.1
C	B	15374	-0.5	-1.0	-0.7
C	C	15374	-0.7	-1.8	-3.0
C	LP	15374	0.0	0.0	0.0
C	VU	15374	-0.5	-1.9	-3.4
C	VL	15374	-0.5	-2.0	-3.9
LP	A	452	0.0	0.0	0.0
LP	B	452	0.0	0.0	0.0
LP	C	452	0.0	0.0	0.0
LP	LP	452	-0.2	-1.1	-1.5
LP	VU	452	0.0	0.0	0.0
LP	VL	452	0.0	0.0	0.0
VU	A	21097	-0.2	-0.1	-0.1
VU	B	21097	-0.4	-0.7	-0.4
VU	C	21097	-0.6	-1.6	-2.6
VU	LP	21097	0.0	0.0	0.0
VU	VU	21097	-0.8	-2.0	-3.3
VU	VL	21097	-0.8	-2.3	-3.9
VL	A	24853	-0.1	-0.1	0.0
VL	B	24853	-0.4	-0.6	-0.3
VL	C	24853	-0.6	-1.4	-2.4
VL	LP	24853	0.0	0.0	0.0
VL	VU	24853	-0.7	-1.8	-3.0
VL	VL	24853	-0.8	-2.1	-3.5

Table 11. Percentage of coverage loss due to adjacent channel (-1) short spacing in the upper VHF band F(90,90), for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-0.4	-0.9	-0.8
A	B	1961	0.0	0.0	0.0
A	C	1961	0.0	0.0	0.0
A	LP	1961	-0.3	-0.3	-0.2
A	VU	1961	0.0	0.0	0.0
A	VL	1961	0.0	0.0	0.0
B	A	6354	-0.2	-0.2	-0.2
B	B	6354	-0.5	-1.0	-1.4
B	C	6354	0.0	0.0	-0.5
B	LP	6354	-0.1	-0.1	0.0
B	VU	6354	0.0	0.0	-0.3
B	VL	6354	0.0	0.0	-0.3
C	A	15374	-0.1	-0.1	0.0
C	B	15374	-0.3	-0.5	-0.3
C	C	15374	-0.6	-1.2	-2.0
C	LP	15374	0.0	0.0	0.0
C	VU	15374	-0.3	-1.3	-2.5
C	VL	15374	-0.2	-1.4	-2.9
LP	A	452	0.0	0.0	0.0
LP	B	452	0.0	0.0	0.0
LP	C	452	0.0	0.0	0.0
LP	LP	452	-0.4	-1.1	-1.1
LP	VU	452	0.0	0.0	0.0
LP	VL	452	0.0	0.0	0.0
VU	A	21097	-0.1	0.0	0.0
VU	B	21097	-0.3	-0.3	-0.2
VU	C	21097	-0.5	-1.1	-1.7
VU	LP	21097	0.0	0.0	0.0
VU	VU	21097	-0.6	-1.5	-2.3
VU	VL	21097	-0.7	-1.8	-2.9
VL	A	24853	-0.1	0.0	0.0
VL	B	24853	-0.2	-0.2	-0.1
VL	C	24853	-0.5	-1.0	-1.6
VL	LP	24853	0.0	0.0	0.0
VL	VU	24853	-0.5	-1.4	-2.2
VL	VL	24853	-0.7	-1.7	-2.7

Table 12.

Percentage of coverage loss due to adjacent channel (-1) short spacing in the UHF band F(90,90),
for 10 %, 20% and 30% short spacings

PROT	INTERF	AREA	PERC_10	PERC_20	PERC_30
A	A	1961	-0.4	-0.9	-1.1
A	B	1961	0.0	0.0	0.0
A	C	1961	0.0	0.0	0.0
A	LP	1961	-0.3	-0.3	-0.3
A	VU	1961	0.0	0.0	0.0
A	VL	1961	0.0	0.0	0.0
B	A	6354	-0.2	-0.3	-0.2
B	B	6354	-0.6	-1.1	-1.8
B	C	6354	0.0	-0.2	-1.7
B	LP	6354	-0.1	-0.1	-0.1
B	VU	6354	0.0	-0.4	-2.5
B	VL	6354	0.0	-0.3	-2.7
C	A	15374	-0.1	-0.1	0.0
C	B	15374	-0.4	-0.7	-0.6
C	C	15374	-0.7	-1.7	-2.6
C	LP	15374	0.0	0.0	0.0
C	VU	15374	-0.9	-2.3	-3.9
C	VL	15374	-0.8	-2.4	-4.3
LP	A	452	0.0	0.0	0.0
LP	B	452	0.0	0.0	0.0
LP	C	452	0.0	0.0	0.0
LP	LP	452	-0.4	-1.1	-1.3
LP	VU	452	0.0	0.0	0.0
LP	VL	452	0.0	0.0	0.0
VU	A	21097	-0.1	-0.1	0.0
VU	B	21097	-0.3	-0.6	-0.4
VU	C	21097	-0.6	-1.5	-2.3
VU	LP	21097	0.0	0.0	0.0
VU	VU	21097	-0.8	-2.1	-3.5
VU	VL	21097	-0.9	-2.4	-4.0
VL	A	24853	-0.1	0.0	0.0
VL	B	24853	-0.3	-0.6	-0.3
VL	C	24853	-0.6	-1.5	-2.3
VL	LP	24853	0.0	0.0	0.0
VL	VU	24853	-0.8	-2.1	-3.4
VL	VL	24853	-0.9	-2.3	-3.0

Figure 1. Reduced service contour for a 30% short spacing of the co-channel required separation distance for a class A station in the UHF band F(50,90).

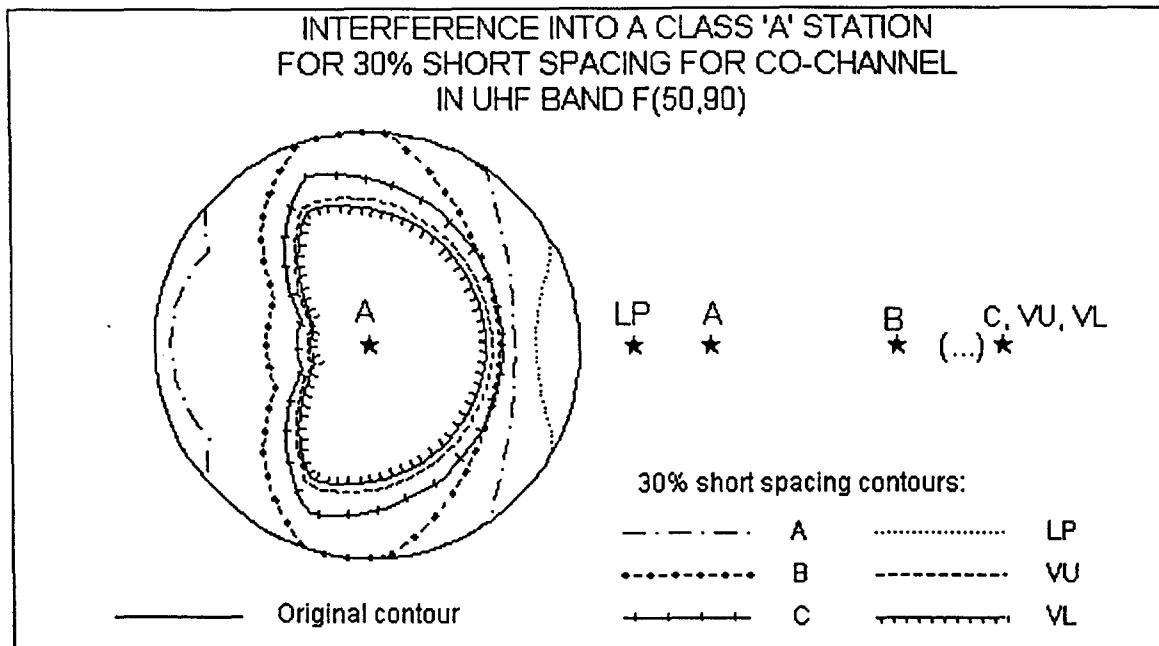


Figure 2. Reduced service contour for a 30% short spacing of the co-channel required separation distance for a class VU station in the upper VHF band F(50,90).

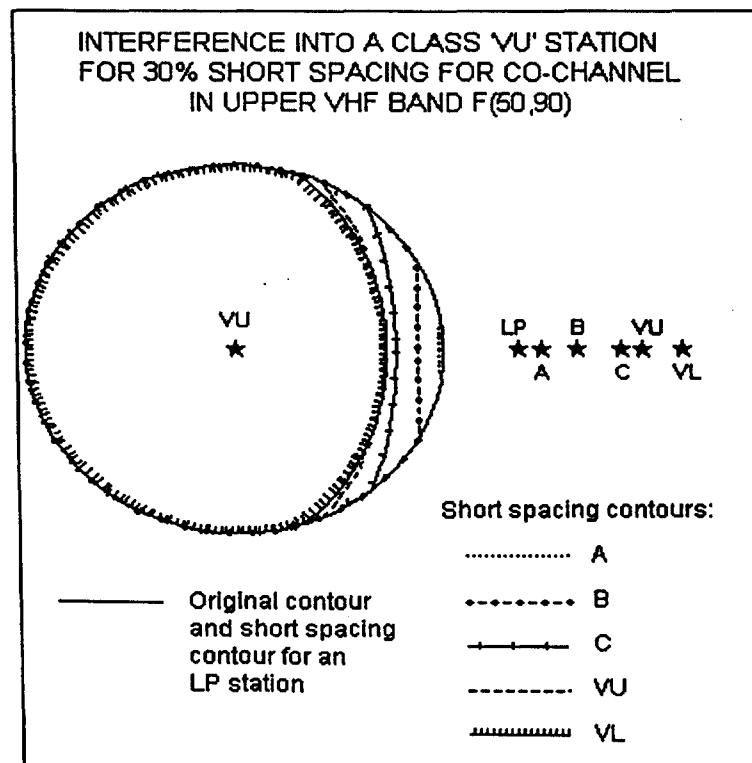


Figure 3. Reduced service contour for a 30% short spacing of the first adjacent channel required separation distance for a class LP station in the UHF band F(50,90).

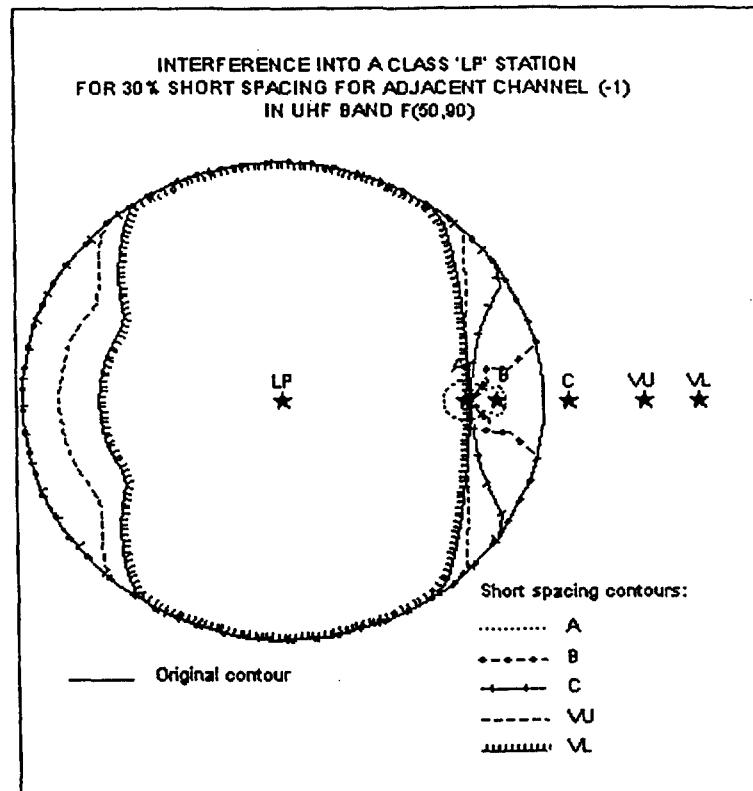


Figure 4. Reduced service contour without any short spacing of the co-channel required separation distance for a class LP station in the UHF band F(90,90).

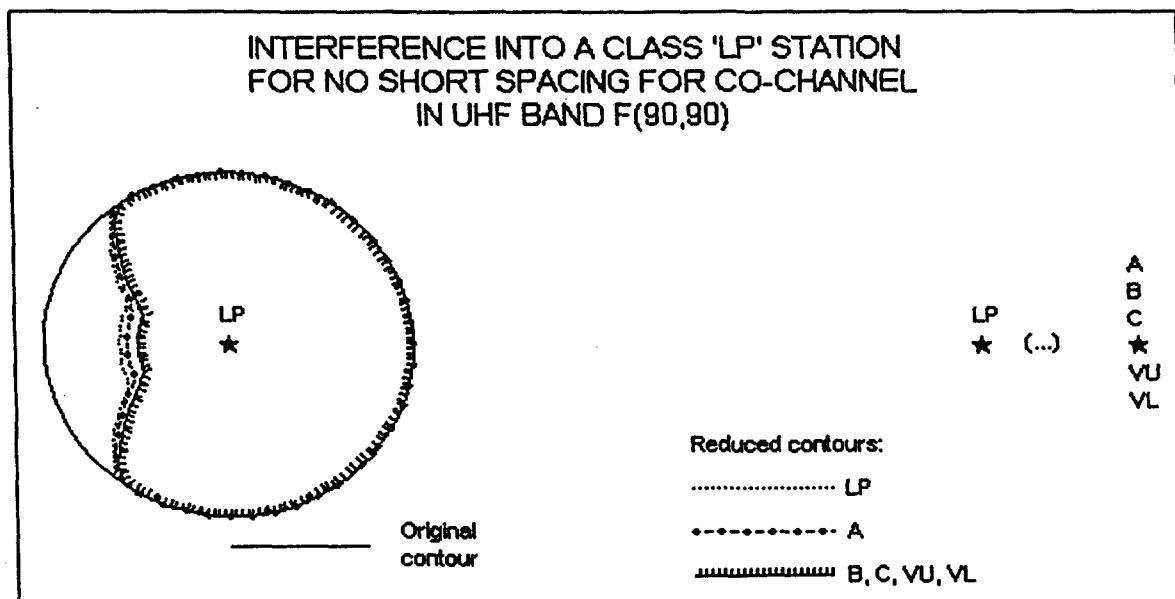


Table 13a.

Adjustments in the required separation distances for the DTV->DTV table for the low VHF band F(50,90)

Protected Class	Interfering Class	Old Separation Distance (km)	New Separation Distance (km)
B	LP	115	124
C	LP	168	181
LP	B	115	124
LP	C	168	181
LP	VU	202	216
LP	VL	224	239
VU	LP	202	216
VL	LP	224	239

Table 13b.

Adjustments in the required separation distances for the DTV->DTV table for the high VHF band F(50,90)

Protected Class	Interfering Class	Old Separation Distance (km)	New Separation Distance (km)
A	C	142	154
A	LP	55	63
A	VU	173	191
A	VL	195	215
B	LP	87	103
C	A	142	154
C	LP	129	166
LP	A	55	63
LP	B	87	103
LP	C	129	166
LP	LP	31	33
LP	VU	160	203
LP	VL	182	227
VU	A	173	191
VU	LP	160	203
VL	A	195	215
VL	LP	182	227

Table 13c. Adjustments in the required separation distances for the DTV->DTV table for the UHF band F(50,90)

Protected Class	Interfering Class	Old Separation Distance (km)	New Separation Distance (km)
A	B	91	114
A	C	162	204
A	LP	45	56
A	VU	209	258
A	VL	231	283
B	A	91	114
B	C	182	185
B	LP	78	126
B	VU	229	239
B	VL	251	264
C	A	162	204
C	B	182	185
C	LP	149	216
LP	A	45	56
LP	B	78	126
LP	C	149	216
LP	LP	27	30
LP	VU	196	270
LP	VL	218	296
VU	A	209	258
VU	B	229	239
VU	LP	196	270
VL	A	231	283
VL	B	251	264
VL	LP	218	296

Table 13d. Adjustments in the required separation distances for the DTV->DTV table for the low VHF band F(90,90)

Protected Class	Interfering Class	Old Separation Distance (km)	New Separation Distance (km)
A	LP	119	131
B	LP	178	192
C	LP	236	253
LP	A	119	131
LP	B	178	192
LP	C	236	253
LP	LP	85	96
LP	VU	273	290
LP	VL	296	316
VU	LP	273	290
VL	LP	296	316

Table 13e. Adjustments in the required separation distances for the DTV->DTV table for the high VHF band F(90,90)

Protected Class	Interfering Class	Old Separation Distance (km)	New Separation Distance (km)
A	B	140	157
A	C	203	224
A	LP	87	109
A	VU	240	266
A	VL	264	292
B	A	140	157
B	LP	127	168
C	A	203	224
C	LP	190	236
LP	A	87	109
LP	B	127	168
LP	C	190	236
LP	LP	56	77
LP	VU	227	277
LP	VL	251	303
VU	A	240	266
VU	LP	227	277
VL	A	264	292
VL	LP	251	303

Table 13f.

Adjustments in the required separation distances for the DTV->DTV table for the UHF band F(90,90)

Protected Class	Interfering Class	Old Separation Distance (km)	New Separation Distance (km)
A	A	87	112
A	B	153	195
A	C	242	297
A	LP	74	124
A	VU	295	363
A	VL	315	386
B	A	153	195
B	B	173	177
B	C	262	278
B	LP	140	207
B	VU	315	344
B	VL	335	368
C	A	242	297
C	B	262	278
C	LP	229	309
LP	A	74	124
LP	B	140	207
LP	C	229	309
LP	LP	49	88
LP	VU	282	375
LP	VL	302	398
VU	A	295	363
VU	B	315	344
VU	LP	282	375
VL	A	315	386
VL	B	335	368
VL	LP	302	398

Table 14a. Adjustments in the required separation distances for the DTV->NTSC table for the low VHF band F(50,90)

Protected Class	Interfering Class	Old Separation Distance (km)	New Separation Distance (km)
B	LP	104	109
C	LP	159	172
LP	A	81	82
LP	B	124	136
LP	C	180	194
LP	LP	44	47
LP	VU	214	230
LP	VL	236	253
VU	LP	185	199
VL	LP	202	216

Table 14b. Adjustments in the required separation distances for the DTV->NTSC table for the high VHF band F(50,90)

Protected Class	Interfering Class	Old Separation Distance (km)	New Separation Distance (km)
A	LP	81	97
A	VL	158	167
B	A	127	139
B	LP	114	150
C	A	187	206
C	LP	174	218
LP	C	109	121
LP	LP	51	70
LP	VU	122	155
LP	VL	138	178
VU	A	221	243
VU	LP	208	254

Table 14c. Adjustments in the required separation distances for the DTV->NTSC table for the UHF band F(50,90)

Protected Class	Interfering Class	Old Separation Distance (km)	New Separation Distance (km)
A	A	81	99
A	C	126	143
A	LP	68	111
A	VU	150	192
A	VL	171	215
B	A	125	162
B	LP	112	174
B	VL	191	197
C	A	196	241
C	B	216	223
C	LP	183	254
LP	A	59	68
LP	C	104	155
LP	LP	46	80
LP	VU	137	204
LP	VL	158	227

Table 15a. Adjustments in the required separation distances for the NTSC->DTV table for the low VHF band F(50,90)

Protected Class	Interfering Class	Old Separation Distance (km)	New Separation Distance (km)
A	LP	81	82
B	LP	124	136
C	LP	180	194
LP	B	104	109
LP	C	159	172
LP	LP	44	47
LP	VU	185	199
LP	VL	202	216
VU	LP	214	230
VL	LP	236	253

Table 15b. Adjustments in the required separation distances for the NTSC->DTV table for the high VHF band F(50,90)

Protected Class	Interfering Class	Old Separation Distance (km)	New Separation Distance (km)
A	B	127	138
A	C	187	206
A	VU	221	243
C	LP	109	121
LP	A	81	97
LP	B	114	150
LP	C	174	218
LP	LP	51	70
LP	VU	208	254
VU	LP	122	155
VL	A	158	166
VL	LP	138	178